

IN THE CLAIMS:

1 1. (Currently Amended) A cathode block for aluminum refining with 15 ~~[[--]]~~ to
2 100 wt % of calcined coke, characterized in that the calcined coke is prepared by coking and
3 calcining after mixing heavy crude oil containing 10 ~~[[--]]~~ to 25 wt % of quinoline insoluble with
4 3 ~~[[--]]~~ to 20 wt % of carbon black.

1 2. (Currently Amended) ~~[[A]]~~ The cathode block for aluminum refining according
2 to claim 1, wherein the heavy crude oil is coal tar pitch.

1 3. (Currently Amended) ~~[[A]]~~ The cathode block for aluminum refining according
2 to claim 1, wherein the heavy crude oil contains quinoline insoluble at 15 ~~[[--]]~~ to 20 wt %.

1 4. (Currently Amended) ~~[[A]]~~ The cathode block for aluminum refining according
2 to claim 1, wherein the average particle diameter of the carbon black is more than 10 nm.

1 5. (Currently Amended) ~~[[The]]~~ A manufacturing process of a cathode block for
2 aluminum refining by adding binder pitch to the mixture of 15 ~~[[--]]~~ to 100 wt % of calcined coke
3 and 0 ~~[[--]]~~ to 85 wt % of carbonaceous material, and then kneading, forming, baking and
4 graphitizing, wherein the calcined coke is prepared by coking and calcining after mixing heavy
5 crude oil containing 10 ~~[[--]]~~ to 25 wt % of quinoline insoluble with 3 ~~[[--]]~~ to 20 wt % of carbon
6 black.

1 6. (New) The cathode block for aluminum refining according to claim 1 wherein the
2 bulk density is less than 1.62 g/cm³ and the specific resistivity is greater than 13 μΩm.

1 7. (New) The cathode block for aluminum refining according to claim 1 wherein the
2 cathode block is graphitized.

1 8. (New) The cathode block for aluminum refining according to claim 7 wherein the
2 cathode block is formed into a cylinder shape.

1 9. (New) The cathode block for aluminum refining according to claim 8 wherein the
2 abrasion is less than 33% in volume when rotated in an alumina particle slurry at 240 rpm for a
3 period of four hours.

1 10. (New) A method of manufacturing a cathode block for use in aluminum refining
2 comprising the steps of:

3 calcining a coke pre-form having a mixture of a heavy crude oil containing 10 to
4 25 wt % of quinoline insoluble and a carbon black, the carbon black being 3 to 20 wt % of the
5 mixture;

6 crushing the calcined coke pre-form;

7 mixing the crushed calcined coke with a binder pitch and carbonaceous material;

8 forming a block of the mixture of calcined coke, carbonaceous material and
9 binder pitch;

10 baking the block of calcined coke, carbonaceous material and binder pitch at a
11 temperature between 800° to 1300° C for at least 10 hours; and

12 graphitizing the baked block at a temperature between 2400° to 3000° C for at
13 least 5 hours.

1 11. (New) The method of manufacturing of claim 10 further including cutting the
2 cathode block into a cylinder.

1 12. (New) The method of manufacturing of claim 10 wherein the mixture of crushed
2 calcined coke, binder pitch and carbonaceous material is kneaded at a temperature in the range of
3 120° C to 150° C before being formed into a block.

1 13. (New) The method of manufacturing of claim 10 wherein calcining is performed
2 at a temperature range of 1300° C to 1500° C for a time period of 1 to 3 hours.

1 14. (New) The method of manufacturing of claim 10 wherein the carbon black is
2 within a range of 3 to 5 wt % and the quinoline insoluble is within a range of 15 to 20 wt %.

1 15. (New) The method of manufacturing of claim 14 wherein an average particle
2 diameter of the carbon black is between 10 nm and 100 nm.

1 16. (New) The method of manufacturing of claim 15 wherein iodine adsorption is
2 less than 100 mg/g of carbon black.